1652

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/606,129A

DATE: 02/12/2001 TIME: 15:06:26 RECEIVED

Input Set : A:\U607921.app

Output Set: N:\CRF3\02122001\1606129A.raw

MAR 0 1 2001

TECH CENTER 1600/2900

3 <110> APPLICANT: Maines, Mahin D. <120> TITLE OF INVENTION: BILIVERDIN REDUCTASE FRAGMENTS AND VARIANTS, AND METHODS OF USING BILIVERDIN REDUCTASE AND SUCH FRAGMENTS AND VARIANTS 9 <130> FILE REFERENCE: 176/60792 11 <140> CURRENT APPLICATION NUMBER: 09/606,129A 12 <141> CURRENT FILING DATE: 2000-06-28 14 <150> PRIOR APPLICATION NUMBER: 60/141,309 15 <151> PRIOR FILING DATE: 1999-06-28 17 <150> PRIOR APPLICATION NUMBER: 60/163,223 18 <151> PRIOR FILING DATE: 1999-11-03 20 <160> NUMBER OF SEQ ID NOS: 37 22 <170> SOFTWARE: PatentIn Ver. 2.1 24 <210> SEQ ID NO: 1 25 <211> LENGTH: 296 26 <212> TYPE: PRT 27 <213> ORGANISM: Homo sapiens 29 <400> SEQUENCE: 1 30 Met Asn Ala Glu Pro Glu Arg Lys Phe Gly Val Val Val Val Val Gly Val 31 1 10 33 Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro 34 \$20\$ 25 3036 Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu 35 39 Gly Ser 1le Asp Gly Val Gln Cln Tle Ser Leu Glu Asp Ala Leu Ser 40 5.5 60 42 Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His 70 45 Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val 8.5 90 46 Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu 105 51 Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu 125 120 52 115 54 Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp 1.35 1.40 130 57 Leu Leu Lys Gly Ser Leu Leu Phe Thr Ser Asp Pro Leu Glu Glu Asp 150 58 145 155 60 Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu 1.65 1.70 175 63 Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu 64 180 1.85 66 Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu 67 1.95 200 205 69 Tys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys 70 210 215 220 70 21.0 215 220 72 Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn

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see pages

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Input Set : A:\U607921.app

Output Set: N:\CRF3\02122001\1606129A.raw

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73 225
                                           235
                       230
75 Val Pro Asn Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asn
                245
                              250
78 lle Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala
                                                     270
        260 265
81 Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile
82
   275
                            280
84 Gln Lys Tyr Cys Cys Ser Arg Lys
85 290
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90 <212> TYPE: DNA
91 <213> ORGANISM: Homo sapiens
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95 atgaatgcag aqcccgagag gaagtttggc gtggtggtgg ttggtgttgg ccgagccggc 120
96 teegtgegga tgagggaett geggaateea caecetteet eagegtteet gaacetgatt 180
97 ggcttcgtgt cgagaaggga gctcgggagc attgatggag tccagcagat ttctttggag 240
98 gatyctettt ecagecaaga ygtggaggte yeetatatet geaytgagag etecagecat 300
99 gaggactaca teaggeagtt cettaatget ggeaageacg teettgtgga ataccecatg 360
100 acactyteat tygogycogo teaggaacty tyggayetyy etyagoagaa aggaaaayte 420
101 ttgcacgagg agcatgttga actottgatg gaggaattcg ctttcctgaa aaaagaagtg 480
102 gtggggaaag acetgetgaa agggtegete etetteaeat etgaceegtt ggaagaagae 540
103 eggittiget teectgeatt eageggeate tetegaetga eetggetggt eteectettt 600
104 ggggagettt etettytyte tyceaettty gaaqagegaa aggaagatea gtatatyaaa 660
105 atgacagtgt gtctggagac agagaagaaa agtccactgt catggattga agaaaaagga 720
106 cotggtetaa aacgaaacag atatttaage ttecatttea agtetgggte cttggagaat 780
107 gtgccaaatg taggagtgaa taagaacata tttctgaaag atcaaaatat atttgtccag 840
108 aaactettgg gecagttete tgagaaggaa etggetgetg aaaagaaacg cateetgeac 900
109 tgcctggggc ttgcagaaga aatccagaaa tattgctgtt caaggaagta agaggaggag 960
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115 <211> LENGTH: 296
116 <212> TYPE: PRT
117 <213> ORGANISM: Homo sapiens
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121 1 5 10 15
123 Gly Arg Ala Gly Ser Val Arg Met Arg Asp Leu Arg Asn Pro His Pro 124 \phantom{\bigg|}20\phantom{\bigg|}25\phantom{\bigg|}30\phantom{\bigg|}
126 Ser Ser Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu 127 35 40 45
129 Gly Ser Ile Asp Gly Val Gln Gln Ile Ser Leu Glu Asp Ala Leu Ser
130 50 55 60
132 Ser Gln Glu Val Glu Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His
133 65 70 75 80
135 Glu Asp Tyr Ile Arg Gln Phe Leu Asn Ala Gly Lys His Val Leu Val
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Input Set : A:\U607921.app

Output Set: N:\CRF3\02122001\1606129A.raw

138 Glu Tyr Pro Met Thr Leu Ser Leu Ala Ala Ala Gln Glu Leu Trp Glu 105 100 141 Leu Ala Glu Gln Lys Gly Lys Val Leu His Glu Glu His Val Glu Leu 142 115. 120 125 144 Leu Met Glu Glu Phe Ala Phe Leu Lys Lys Glu Val Val Gly Lys Asp 145 130 135 140 147 Leu Leu Lys Gly Ser Leu Leu Phe Thr Ala Gly Pro Leu Glu Glu Glu 148 145 $150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150150$ 150 Arg Phe Gly Phe Pro Ala Phe Ser Gly Ile Ser Arg Leu Thr Trp Leu 151 165 170 175 153 Val Ser Leu Phe Gly Glu Leu Ser Leu Val Ser Ala Thr Leu Glu Glu 154 $$ 180 $$ 185 $$ 185 $$ 190 $$ 156 Arg Lys Glu Asp Gln Tyr Met Lys Met Thr Val Cys Leu Glu Thr Glu 157 195 200 205 205 159 Lys Lys Ser Pro Leu Ser Trp Ile Glu Glu Lys Gly Pro Gly Leu Lys 160 210 215 220 162 Arg Asn Arg Tyr Leu Ser Phe His Phe Lys Ser Gly Ser Leu Glu Asn 163 225 230 235 240 1.65 Val Pro Asn Val Gly Val Asn Lys Asn I.1e Phe Leu Lys Asp Gln Asn 1.66 245 250 255 168 Tle Phe Val Gln Lys Leu Leu Gly Gln Phe Ser Glu Lys Glu Leu Ala 169 260 171 Ala Glu Lys Lys Arg Ile Leu His Cys Leu Gly Leu Ala Glu Glu Ile 172 285 280 285 174 Gln Lys Tyr Cys Cys Ser Arg Lys 1.75 290 295 178 <210> SEQ ID NO: 4 1.79 <21.1> LENGTH: 295 180 <212> TYPE: PRT 181 <213> ORGANISM: Rattus norvegicus 1.83 <400> SEQUENCE: 4 184 Met Asp $\bar{\text{Ala}}$ Glu Pro Lys Arg Lys Phe Gly Val Val Val Val Gly Val 185 1 5 10 15 187 Gly Arg Ala Gl $_{
m Y}$ Ser Val Arg Leu Arg Asp Leu Lys Asp Pro Arg Ser 188 20 25 30 190 Ala Ala Phe Leu Asn Leu Ile Gly Phe Val Ser Arg Arg Glu Leu Gly 191 $$ 35 $$ 40 $$ 45 193 Ser Leu Asp Glu Val Arg Gln Ile Ser Leu Glu Asp Ala Leu Arg Ser 194 50 196 Gln Glu Ile Asp Val Ala Tyr Ile Cys Ser Glu Ser Ser Ser His Glu 197 65 70 75 80 199 Asp Tyr Ile Arg Gln Phe Leu Gln Ala Gly Lys His Val Leu Val Glu 200 85 90 95202 Tyr Pro Met Thr Leu Ser Phe Ala Ala Ala Gln Glu Leu Trp Glu Leu 203 100 105 110 205 Ala Ala Gln Lys Gly Arg Val Leu His Glu Glu His Val Glu Leu Leu 206 115 120 125 208 Met Glu Glu Phe Glu Phe Leu Arg Glu Val Leu Gly Lys Glu Leu 1.35 209 1.30

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PATENT APPLICATION: US/09/606,129A TIME: 15:06:26

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Output Set: N:\CRF3\02122001\1606129A.raw

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211 Leu Lys Gly Ser Leu Arg Phe Thr Ala Ser Pro Leu Glu Glu Glu Arg
212 145
                     1.50
                                       155
214 Phe Gly Phe Pro Ala Phe Ser Gly 11e Ser Arg Leu Thr Trp Leu Val
215
            165
                                     170
                                                        175
217 Ser Leu Phe Gly Glu Leu Ser Leu Ile Ser Ala Thr Leu Glu Glu Arg
          180
                                 185
218
220 Lys Glu Asp Gln Tyr Met Lys Met Thr Val Gln Leu Glu Thr Gln Asn
221, 195
                           200
                                            205
223 Lys Gly Leu Leu Ser Trp 1le Glu Glu Lys Gly Pro Gly Leu Lys Arg
                        215
224 210
226 Asn Arg Tyr Val Asn Phe Gln Phe Thr Ser Gly Ser Leu Glu Glu Val
                230
227 225
                                       235
229 Pro Ser Val Gly Val Asn Lys Asn Ile Phe Leu Lys Asp Gln Asp Ile
230
                  245
                                     250
232 Phe Val Gln Lys Leu Leu Asp Gln Val Ser Ala Glu Asp Leu Ala Ala
                       265
                                                     270
233
            260
235 Glu Lys Lys Arg Ile Met His Cys Leu Gly Leu Ala Ser Asp Ile Gln
236 275
                   280
238 Lys Leu Cys His Gln Lys Lys
239 290 295
242 <210> SEQ ID NO: 5
243 <211> LENGTH: 1081
244 <212> TYPE: DNA
245 <213> ORGANISM: Rattus norvegicus
247 <400> SEQUENCE: 5
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250 gaaatttgga gtggtagtgg ttggtgttgg cagagctggc tcggtgaggc tgagggactt 180
251 gaaggateea egetetgeag catteetgaa eetgattgga tttgtgteea gaegagaget 240
252 tgggagcett gatgaagtac ggcagatttc tttggaagat geteteegaa gccaagagat 300
253 tgatgtegee tatatttgea gtqagagtte cagecatgaa gactatatae ggcagtttet 360
254 geaggetgge aageatgtee tegtggaata ceceatqaea etgteatttg eggeggeeca 420
255 ggagetgtgg gagetggeeg caeagaaagg gagagteetg eatgaggage acgtggaact 480
256 cttgatggag gaattegaat teetgagaag agaagtgttg gggaaagage taetgaaagg 540
257 gtotottogo ttoacagota goccactaga agaagagaga tttggottoc etgogttoag 600
258 eggeatttet egeetgacet ggetggtete cetetteggg gagetttete ttatttetge 660
259 caccttggaa gagcgaaaag aggatcagta tatgaaaatg accgtgcagc tggagaccca 720
260 gaacaagggt ctgctgteat ggattgaaga gaaagggeet ggettaaaaa gaaacagata 780
261 tgtaaacttc cagttcactt ctgggtccct ggaggaagtq ccaagtgtag gggtcaataa 840
262 gaacatttte etgaaagate aggatatatt tgtteagaag etettagace aggtetetge 900
263 agaggacetg getgetgaga agaagegeat catgeattge etggggetgg ceagegacat 960
264 ccagaagett tgccaccaga agaagtgaag aggaagette agagaettet gaagggggee 1020
265 agggtttggt cetateaace atteacettt agetettaca attaaacatg teagataaac 1080
266 a
269 <210> SEQ ID NO: 6
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270 <211> LENGTH: 6 271 <212> TYPE: PRT

274 <220> FEATURE:

272 <213> ORGANISM: Artificial Sequence

PATENT APPLICATION: US/09/606,129A TIME: 15:06:26 Input Set : A:\U607921.app Output Set: N:\CRF3\02122001\1606129A.raw 275 <223> OTHER INFORMATION: Description of Artificial Sequence: hydrophobic 276 domain of BVR 278 <220> FEATURE: 279 <221> NAME/KEY: PEPTIDE 280 <222> LOCATION: (2) 281 <223> OTHER INFORMATION: where X is any aa 283 <400> SEQUENCE: 6 W--> 284 Phe Xaa Val Val Val Val 285 288 <210> SEQ ID NO: 7 289 <211> LENGTH: 6 290 <212> TYPE: PRT 291 <213> ORGANISM: Artificial Sequence 293 <220> FEATURE: 294 <223> OTHER INFORMATION: Description of Artificial Sequence: nucleotide 295 binding domain of BVR 297 <220> FEATURE: 298 <221> NAME/KEY: PEPTIDE 299 <222> LOCATION: (2) 300 <223> OTHER INFORMATION: where \boldsymbol{x} is any aa 302 <220> FEATURE: 303 <221> NAME/KEY: PEPTIDE 304 <222> LOCATION: (4)..(5) 305 <223> OTHER INFORMATION: where X is any aa 307 <400> SEQUENCE: 7 W--> 308 Gly Xaa Gly Xaa Xaa Gly 309 312 <210> SEQ ID NO: 8 313 <211> LENGTH: 8 314 <212> TYPE: PRT 315 <213> ORGANISM: Artificial Sequence 317 <220> FEATURE: 318 <223> OTHER INFORMATION: Description of Artificial Sequence: oxidoreductase domain of BVR 31.9 321 <400> SEQUENCE: 8 322 Ala Gly Leu His Val Leu Val Glu 323 1 326 <210> SEQ ID NO: 9 327 <211> LENGTH: 29 328 <21.2> TYPE: PRT 329 <213> ORGANISM: Artificial Sequence 331 <220> FEATURE: 332 <223> OTHER INFORMATION: Description of Artificial Sequence: leucine 333 zipper of BVR 335 <220> FEATURE: 336 <221> NAME/KEY: PEPTIDE 337 <222> LOCATION: (2)..(7)

RAW SEQUENCE LISTING

DATE: 02/12/2001

Please Note:

340 <220> FEATURE:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

338 <223> OTHER INFORMATION: where X is any aa

DATE: 02/12/2001 TIME: 15:06:27

VERIFICATION SUMMARY
PATENT APPLICATION: US/09/606,129A

Input Set : A:\U607921.app
Output Set: N:\CRF3\02122001\1606129A.raw

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							used,				
L:356	M:341	₩:	(46)	" n "	or	"Xaa"	used,	for	SEQ	1D#:9	
L:359	M:341	W:	(46)	"n"	or	"Xaa"	used,	for	SEQ	1D#:9	
L:406	M:341	W:	(46)	" O "	or	"Xaa"	used,	for	SEQ	ID#:12	
L:453	M:341	₩:	(46)	n Ω n	or	"Xaa"	used,	for	SEQ	ID#:15	
L:472	M:341	W:	(46)	" n "	or	"Xaa"	used,	for	SEQ	1D#:16	
L:496	M:341	W:	(46)	n U u	or	"Xaa"	used,	for	SEQ	ID#:17	